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On the Latitude of the Observatory, Windsor, N.S. Wales.
By John Tebbutt.

The latitude hitherto adopted (namely, $-33° 36' 28''\!\cdot\!9$) is that of the prime vertical pier of the old Observatory as deduced from prime vertical observations with a 2-in. Transit instrument during the years 1867, 1868, 1869, 1870, and 1874. The stars employed were nine in number, culminating within 39′ of the zenith. Their positions, however, rested almost wholly on observations with the old Parramatta Transit Circle at the Sydney Observatory, and were therefore very imperfect. Of the ninety-three observations fifty-nine were made on the middle wire only of the Transit instrument, and thirty-four on a side wire with the instrument reversed, according to Struve's method, both before and after the meridian passage. I have recently investigated a correction to this latitude from more accurate places of the stars as obtained from the Sydney Catalogues for 1877 and 1878, the Melbourne Catalogue for 1870, the Cape Catalogue for 1880, and recent MS. observations kindly communicated by Messrs. Ellery and Russell. The new result is $-33° 36' 29''\!\cdot\!1$, and the reduction $-0''\!\cdot\!4$ applied to this value gives $-33° 36' 29''\!\cdot\!5$ as the latitude of the piers of the Meridian Transit and Equatorial instruments in the new Observatory adjoining, erected in 1879. During the year 1881 I made a new investigation of the latitude by means of an excellent 3-in. Transit instrument temporarily mounted on the prime vertical pier of the new Observatory, the local times being obtained for the purpose by means of the old 2-in. Transit. The stars selected for observation were Nos. 3908, 3916, and 4180 of the Washington Catalogue for 1860, and Nos. 4015, 4309, and 879 of the B.A. Catalogue for 1850. The mean places were adopted from the Southern Catalogues above-mentioned and MS. results obtained by Messrs. Ellery and Russell in 1881, and were weighted according to the number of observations from which each was derived. Proper motion was applied from the best authorities available. The transit system of the 3-in. telescope consists of five threads, and so far as the first five stars are concerned the method adopted was to observe the transits east and west across as many threads as possible, the rotation axis of the instrument being in the same position throughout the observations of each evening. The pivots were, however, reversed between the observations of different evenings. In the case of the last star the transits were observed four times each evening across one or more of the side threads according to Struve's method described in Chauvenet's "Spherical and Practical Astronomy" (1874, vol. ii., p. 262). A value of the latitude was then deduced from each pair of observations of a thread with the pivots in the same direction, and it was thus assumed that the collimation error, which was itself very small throughout the series of observations, would be eliminated from the mean result. During the observations of B.A.C. 879 the opportunity was also taken to note the transit across the middle

Date of Observations.	Star.	Mean Place of Star 1881·0. R.A.	Mean Place of Star 1881·0. Declin.	Authorities.	Number of Separate Results. Clamp N.	Number of Separate Results. Clamp S.	Concluded Seconds of Latitude.
1881.		h m s	° ′ ″				″
Apr. 4, 6, 7, 8, 11, 12, 13, 14, 15, 16, 19, 20	W.C. 3908	9 13 47·83	−33 35 42·3	Sydney, MS. Obs. 1881, Melb. MS. Obs. 1881, & Cape Cat. 1880	14	14	30·8
Apr. 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 19, 20	W.C. 3916	9 14 51 87	−33 36 0·9	Sydney MS. Obs. 1881, Melb. MS. Obs. 1881, & Cape Cat. 1880	15	15	31·1
Apr. 7, 8, 11, 12, 13, 14, 15, 16, 19, 20	W.C. 4180	9 56 48·87	−33 36 4·4	Melb. MS. Obs. 1881, & Cape Cat. 1880	10	14	30·8
May 4, 6, 9, 10, 11, 12, 13, 14	B.A.C. 4015	11 46 53·98	−33 14 45·6	Melb. Cat. 1870 Cape Cat. 1880	18	16	31·0
May 9, 10, 11, 12, 13, 14	B.A.C. 4309	12 44 13·95	−33 21 0·2	Sydney Cat. 1877 Melb. Cat. 1870 Cape Cat. 1880	14	14	31·0
Dec. 10, 17, 21, 23	B.A.C. 879	2 44 6·65	−32 54 22·4	Sydney Cat. 1878 Cape Cat. 1880	8	8	30·6

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thread in opposite positions of the rotation axis as described on pages 263 and 264 of the work above cited. I may remark that the equatorial distances of the side threads from the middle thread had been very carefully determined, and that the level employed was a sensitive one of about 1130 feet radius, each division being equal to $0''\cdot8$. The individual results throughout the series were highly satisfactory. The table on p. 102 exhibits an abstract of the work on each star.

Three observations of B.A.C. 879 on the middle thread as previously described gave a result of $30''\cdot5$. The mean of all the determinations gives $-33^\circ\ 36'\ 30''\cdot9$ as the latitude of the instrument, to which if we apply the reduction $+0''\cdot1$ we get $-33^\circ\ 36'\ 30''\cdot8$ as the latitude of the piers of the Meridian Transit and Equatorial instruments of the new Observatory. This value, which differs $1''\cdot3$ from that obtained by means of the old Transit and an imperfect level, will in future be adopted as the geographical latitude of the Observatory.

Observatory, Windsor, N.S. Wales:
1883, *Nov.* 27.

Note on M. Loewy's Communication referring to an Apparatus for the Determination of Flexures. With some Remarks on Professor Houzeau's (and Mr. Schaeberle's) Proposal on the same Subject.[*]

By A. Marth.

Before submitting to the critical consideration of readers some remarks on M. Loewy's "Réponse," &c., *Monthly Notices*, XLII. p. 287 ff., I may perhaps be allowed to quote the words in which M. Loewy expressed his opinion on my old proposal in his paper, "Nouvelle Méthode pour Déterminer la Flexure des Lunettes," published in the *Comptes Rendus* of December 9, 1878, vol. lxxxvii. p. 891, so that readers may form their own judgment upon the objections, which, as I stated at the last December (1881) meeting, have been such a puzzle to me.

"M. Marth, astronome anglais, a proposé d'établir, dans le cube central de la lunette, et à peu près sur l'axe de rotation, un

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[*] The present paper (which is that alluded to on p. 349 of vol. xlii.) was intended to be published in the Supplementary Number of vol. xlii. of the *Monthly Notices*. But when I learnt that M. Loewy had already sent a second "Réponse," I thought it better to postpone the publication of my own paper, in order to give him precedence, and to avoid cross-writing. Owing to temporary absence in South Africa, I did not get a sight of M. Loewy's second paper till the end of December, when I saw the Supplementary Number at the Cape Observatory. That second "Réponse" made me the more desirous that interested readers, for whose critical examination I had asked already (*vide* p. 349 of vol. xlii.), might form their own judgment before they read what I may have to say, and the delay will have given them time to do so. Under the circumstances I have thought it better to make some alterations, and to indicate my own opinion rather more plainly than I had first intended.